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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BAND, MICHAEL A	
ART UNIT	**PAPER NUMBER**
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08/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/804,754	BELOUSOV ET AL.	
	Examiner	Art Unit	
	Michael Band	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☒ Claim(s) *6,8 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :11/22/2004; 9/26/2005; 4/29/2004; 3/19/2004.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements filed April 29, 2004 and March 19, 2004 lack a signature by either inventor(s) or authorized representative. It has been placed in the application file, but the information referred to therein has not been considered.

2. The information disclosure statement filed September 26, 2005 cites an "European Search Report " as non-patent literature. Said citation has been lined-through because it is not a published document available to the public. However the Examiner has considered the search report.

Specification

3. The disclosure is objected to because of the following informalities: Ti-6Al-2Sn-4Zr-2Mo, Ti-8Al-1V-1Mo and Ti-6Al-2Sn-4Zr-6Mo (para 7, 37-39, 52-53). The Examiner is unsure as to the relevance of the numbers present with these elements. Appropriate correction is required.

4. The disclosure is objected to because of the following informalities: ksi (para 7 and 33). This is an informal abbreviation for well known and more commonly used abbreviation psi.

Claim Objections

5. Claim 6 is objected to because of the following informalities: Ti-6Al-2Sn-4Zr-2Mo, Ti-8Al-1V-1Mo and Ti-6Al-2Sn-4Zr-6Mo. Appropriate correction is required.

6. Claims 8-9 are objected because of the following informalities: ksi. This is an informal abbreviation for well known and more commonly used abbreviation psi. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> **The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.**

8. Claim 18 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant claims different bias voltage sources for a first sputtering target and second sputtering target, with the two bias voltage sources being different. There is no support for this claim in the disclosure.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-5, 7, 10-11, 13-14, and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Wortman et al (USPGPub 2005/0266163).

With respect to claim 1, Wortman '163 discloses a method for efficiently applying coating systems (i.e. deposition material) on a substrate (i.e. part) and evaporating compositionally controlled bond coats (i.e. components) in a directed vapor deposition (DVD) apparatus (abstract; figure 5). The DVD apparatus comprises a vacuum chamber (i.e. deposition chamber) (figure 5, part 4) and a substrate bias system (figure 6, part 352) capable of applying a DC or alternating potential to at least one of the substrates (figure 6, part 320) (p. 2, para 0014). It is well known that DVD is a form of physical vapor deposition (PVD) and sputtering (p. 1, para 0009). The ionized vapor flux (i.e. components) are attracted to the substrate surface by allowing a self-bias of ionized gas and vapor stream or the potential to pull the ionized stream to the substrate (p. 2, para 0014). Wortman '163 further discloses that the vapor flux is from material A and/or B in addition to material C, thus a first and second component are co-deposited (i.e. via sputtering) (p. 5, para 51).

With respect to claim 2, Wortman '163 further discloses that sputtering with DC, RF, microwave and or/magnetron is used to deposit the bond coating (p. 1, para 0009). It is inherent that a power source, and therefore a voltage, is applied to a target, as

evidenced by www.wikipedia.com (Document U of PTO 892, p. 2, filed 8/2/2007) and Miller et al (US Patent No. 6,627,050).

With respect to claim 3, Wortman '163 depicts in figure 6 material feeder rods (i.e. sputter target of first component) (parts 325 and 326) where the vapor stream (i.e. ion flowpath) (part 315) encircles the feeder rods (i.e. first components) to a substrate (i.e. part) (part 320) (p. 6, para 0053).

With respect to claims 4 and 5, Wortman '163 further discloses that materials A, B, and C include refractory metals such as molybdenum (Mo), tungsten (W), niobium (Nb), and tantalum (Ta) (p. 5, para 0051) as evidenced by www.wikipedia.com (Document V of PTO-892, p. 2, filed 8/2/2007).

With respect to claim 7, Wortman '163 further depicts in figure 7 gaps (i.e. missing material) (part 91) from the outer surface (part 97) of columnar grains (i.e. deposited material) (part 93) and secondary grains (i.e. additional deposited material) (part 82).

With respect to claim 10, Wortman '163 further discloses applying a thermal barrier coating commonly used in aircraft turbines and rocket engines (p.1, para 0005-0006), where the thermal barrier coating is comprised of titanium (p. 5, para 0047). It is well known that titanium comprises aircraft engines as evidenced by www.wikipedia.com (Document X of PTO-892, p. 1, filed 8/2/2007).

With respect to claim 11, Wortman '163 further discloses a method for efficiently applying coating systems (i.e. deposition material) on a substrate (i.e. part) and evaporating compositionally controlled bond coats (i.e. components) in a directed vapor

deposition (DVD) apparatus (abstract, figure 5). The DVD apparatus comprises a vacuum chamber (i.e. deposition chamber) (figure 5, part 4) and a substrate bias system (figure 6, part 352) capable of applying a DC or alternating potential to at least one of the substrates (figure 6, part 320) (p. 2, para 0014). It is well known that DVD is a form of physical vapor deposition (PVD) (p. 1, para 0009). The ionized vapor flux (i.e. components) are attracted to the substrate surface by allowing a self-bias of ionized gas and vapor stream or the potential to pull the ionized stream to the substrate (p. 2, para 0014). Wortman '163 further discloses that the vapor flux is from material A and/or B in addition to material C, thus a first and second component are co-deposited (i.e. via sputtering) (p. 5, para 51). Wortman '163 further discusses using appropriate process controls to control the morphology, composition, dispersoid size, and concentration of the bond coat (p. 2, para 0011).

With respect to claim 13, Wortman '163 further discloses a method for efficiently applying coating systems (i.e. deposition material) on a substrate (i.e. part) and evaporating compositionally controlled bond coats (i.e. components) in a directed vapor deposition (DVD) apparatus (i.e. sputtering) (abstract; figure 5; p.1, para 0009). The DVD apparatus comprises a vacuum chamber (i.e. deposition chamber) (figure 5, part 4) and a substrate bias system (figure 6, part 352) capable of applying a DC or alternating potential to at least one of the substrates (figure 6, part 320) (p. 2, para 0014). It is well known that DVD is a form of physical vapor deposition (PVD) (p. 1, para 0009). Wortman '163 further discloses that the vapor flux is from material A and/or B in addition to material C, thus a first and second component are co-deposited (i.e. via

sputtering) (p. 5, para 51). Wortman '163 depicts in figure 6 a first feed rod (i.e. first target) (part 325) and second feed rod (i.e. second target) (part 326) composed of evaporants A & B and C, respectively (p. 6, para 0053). Wortman '163 further states that a bias generator controls application of a positive, negative, or periodically alternating voltage between the substrate and the plasma (p. 6, para 0054). It is well known that a PVD apparatus comprises a target with a voltage attached to the target to aid in sputtering, as evidenced by Miller et al (US Patent No. 6,627,050; figure 2, parts 56 and 110) and www.wikipedia.com (Document U of PTO 892, p. 2, filed 8/2/2007).

With respect to claim 14, Wortman '163 further depicts in figure 5 a deposition chamber (part 4) for depositing material (i.e. evaporants A, B, and C) (parts 25 and 26) onto a substrate (i.e. workpiece) (part 20). A substrate bias system capable of applying a DC or alternating potential (i.e. non-zero voltage) to at least one of the substrates is also present in figure 6 (p. 2, para 0014). Wortman '163 further discusses materials A and/or B as evaporant sources in figure 5 (p. 5, para 0051). Wortman '163 also discusses using an additional material (i.e. material C) deposited onto the substrate (p. 5, para 0051). Wortman '163 also describes how material C is present initially as a feed rod (i.e. target) before deposition (p. 6, para 0053). Since Wortman '163 states that sputtering, a known method of PVD, is used for deposition, a target with an applied voltage is present as well and evidenced by Miller et al (US Patent No. 6,627,050; figure 2, parts 56 and 110).

With respect to claim 19, Wortman '163 discloses co-depositing a first material in concurrently or intermittently with a second material (p. 4, para 0038). Furthermore,

Wortman '163 describes various processes that might be used to deposit the materials, including sputtering and electron beam physical deposition (p. 1, para 0009).

With respect to claim 20, Wortman '163 further discloses that first components comprising material C are formed into a feed rod (i.e. ingot) and that material A and B comprise second components and represent two distinct rods (i.e. ingots) of different compositions (p. 5, para 0051; p. 6, para 0053).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wortman et al (USPGPub 2005/0266163 as applied to claims 1 and 14 above, and further in view of Gabriele et al (US Patent No. 6,875,318).

With respect to claims 6 and 15, the reference is cited as discussed for claims 1 and 14. With respect to claims 6 and 15, Wortman '163 further discloses materials A, B, and C include aluminum (Al), molybdenum (Mo), zirconium (Zr), titanium (Ti), and refractory metal alloys (p. 5, para 0051). However Wortman '163 is limited in that while niobium, tantalum, and vanadium are part of column 5 on the periodic table since they share similar characteristics and properties and vanadium (V) is a known refractory

metal as evidenced by www.wikipedia.com (Document V of PTO-892, p. 2, filed 8/2/2007), it is not suggested that vanadium be used in the composition.

Gabriele '318 teaches a method of coating a substrate by leveling the surface of the substrate by physical vapor deposition (PVD) of a metallic coating (abstract). Gabriele '318 further teaches suitable metallic materials for deposition as titanium, zirconium, chromium, gold, silver, platinum, copper, aluminum, tin, molybdenum, boron, graphite, tantalum, tungsten, hafnium, and combinations thereof, with possible alloys being titanium-zirconium, titanium-aluminum-vanadium-nickel-chrome-copper-silver, and aluminum titanium (col. 5, lines 60-67). Gabriele '318 cites the advantage to leveling a substrate as sealing the substrate surface, providing improved corrosion resistance, and promoting the adhesion of coatings to the substrate surface (col. 1, lines 42-54).

It would have been obvious to one of ordinary skill to include vanadium taught in Gabriele '318 for the composition of Wortman '163 in order to gain the advantages of sealing the substrate surface, providing improved corrosion resistance, and promoting the adhesion of coatings to the substrate surface.

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wortman et al (USPGPub 2005/0266163) as applied to claim 7 above, and further in view of Ray et al (US Patent No. 6,986,381).

With respect to claim 8, the reference is cited as discussed for claim 7. However Wortman '163 is limited in that while there must exist some bond strength between the substrate and the coating, no specific value is suggested.

Ray '381 teaches metallic alloys with improved surface quality, structural integrity and mechanical properties fabricated in refractory metals (abstract) such as nickel, cobalt, and iron base superalloys, stainless steel alloys, titanium alloys, titanium aluminide alloys, zirconium alloys, and zirconium aluminide alloys (col. 5, lines 55-62). Ray '381 also provides a more detailed list of the components in a coating in Table 3 (col. 15). A flexural strength (i.e. bend strength) of 40,000 psi (40 ksi) to 75,000 psi (75 ksi) is also described (col. 6, lines 32-35). Ray '381 cites the advantage of using refractory metal alloys due to their hard and wear resistant coating properties (col. 1, lines 10-24).

It would have been obvious to one of ordinary skill in the art to apply the refractory metal alloy properties taught in Ray '381 for Wortman '163 in order to gain the advantages of a superior hard and wear resistant coating.

It has been held that in the case where claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

14. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wortman et al (USPGPub 2005/0266163) and Ray et al (US Patent No. 6,986,391) as applied to claim 8 above, and further in view of Gabriele et al (US Patent No. 6,875,318).

With respect to claim 9, Wortman '163 further discloses that the coating is a thermal barrier coating used in high temperature, very high heat flux environments such as aircraft turbines or rocket engines (p. 1, para 0005-0006). It is well known that titanium, cobalt, and nickel are used in jet turbines and rocket engines as evidenced by

www.wikipedia.com (Documents V, W, X of PTO-892, p. 1, filed 8/2/2007). It is well known that the substrate (I.e. rocket engine) (p. 5, para 0047) be larger than metallic coating since it is unrealistic to have a coating for a rocket engine be larger than the rocket engine itself. However Wortman '163 is limited in that while refractory metals are used, the bond strength of the refractory metals is not suggested.

Ray '381 further teaches a need to improve the fabrication (i.e. targets) of various metallic alloys such as nickel, cobalt and iron based superalloys, nickel aluminides, stainless steel alloys, titanium alloys, titanium aluminide alloys, zironcium alloys, and zirconium aluminide alloys (col. 2, lines 14-27). Ray '381 also states that these alloys typically have a yield strength (i.e. bond strength) in excess of 100 ksi (col. 2, lines 27-30). Ray '381 cites the advantage of using refractory metal alloys due to their hard and wear resistant coating properties (col. 1, lines 10-24).

It would have been obvious to one of ordinary skill in the art to apply the refractory metal alloy properties taught in Ray '381 for Wortman '163 in order to gain the advantages of a superior hard and wear resistant coating.

It has been held that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

In addition, Wortman '163 is further limited in that while the material is deposited onto a substrate, a specific thickness of the metallic coating is not specified.

Gabriele '318 teaches a method of coating a substrate by leveling the surface of the substrate by physical vapor deposition (PVD) of a metallic coating (abstract).

Gabriele '318 further teaches suitable metallic materials for deposition as titanium, zirconium, chromium, gold, silver, platinum, copper, aluminum, tin, molybdenum, boron, graphite, tantalum, tungsten, hafnium, and combinations thereof, with possible alloys being titanium-zirconium, titanium-aluminum-vanadium-nickel-chrome-copper-silver, and aluminum titanium (col. 5, lines 60-67). A thickness of the metallic layer of from about 0.1 millimeter to about 3 millimeter is stated (col. 2, lines 41-45). Gabriele '318 cites the advantage to leveling a substrate as sealing the substrate surface, providing improved corrosion resistance, and promoting the adhesion of coatings to the substrate surface (col. 1, lines 42-54).

It would have been obvious to one of ordinary skill in the art to deposit the amount of metallic material specified taught in Gabriele '318 for the implied amount of metallic material in Wortman '163 in order to gain the advantages of a sealed substrate surface, superior corrosion resistance, and promotion of adhesion of the coatings to the substrate surface.

It has been held that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

15. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wortman et al (USPGPub 2005/0266163) as applied to claim 11 above, and further in view of Matsuzawa et al (US Patent No. 6,080,292).

With respect to claim 12, Wortman '163 further discloses using appropriate process controls to control the morphology, composition, dispersoid size, and

concentration of the bond coat (p. 2, para 0011). Controlling these parameters signifies controlling the plasma characteristics (i.e. density). A substrate bias system capable of applying a DC or alternating potential to one of the substrates is used for plasma assisted deposition (p. 2, para 0014). However Wortman '163 is limited in that while methods are employed for controlling plasma and electrical potential characterisitics (i.e. density and ion current), it is not specifically suggested to monitor these characteristics.

Matsuzawa '292 teaches a monitoring apparatus for plasma process for detecting the change of conditions for the plasma processing apparatus in addition to detecting the change in condition for power supplied to the apparatus (abstract), with the plasma processing apparatus being a PVD apparatus for DC sputtering (col. 5, lines 41-48). Figure 1 depicts the apparatus (part 10) forms a film which is generated by a plasma (col. 1, lines 20-30). The apparatus also comprises a cathode (part 50) as a target and substrate (part 70), where the substrate is seen to have a bias power source attached. Ions generated by the glow discharge (i.e. plasma) collide onto the cathode where neutral particles are emitted and deposited onto the substrate (i.e. workpiece) (col. 1, lines 39-44). Matsuzawa '292 cites the advantage of monitoring the conditions of the plasma and power supplied as the omission of defective products in the earlier stage of the process (col. 2, lines 3-8) along with keeping the reliance and uniformity of the plasma generating mechanism which is directly related the quality of film (col. 1, lines 60-65).

It would have been obvious to one of ordinary skill in the art to use the monitoring apparatus taught in Matsuzawa '292 for the PVD apparatus of Wortman '163 in order to gain the advantages of improved film quality and omission of defective products.

16. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wortman et al (USPGPub 2005/0266163 as applied to claim 14 above, and further in view of Wang (US Patent No. 6,352,629).

With respect to claims 16-18, Wortman '163 further discloses that a DC or alternating potential (i.e. AC or RF) is used to bias the substrate (p. 2, para 0014). Wortman '163 also describes how two distinct materials are present as rods (i.e. targets) (p. 6, para 0053). However Wortman '163 is limited in that while it is known to bias sputter targets, it is not specifically suggested. Wortman '163 is further limited in that while it is discussed to use two distinct rods, it is not suggested to bias each rod with a different voltage.

Wang '629 teaches a DC magnetron for sputtering metal atoms onto a substrate via a high density plasma (i.e. physical vapor deposition) (abstract; col. 4, lines 44-61). Wang '629 further teaches biasing the substrate (i.e. first bias voltage) with an RF power source of 13.56 MHz (col. 4, lines 61-67) while biasing for the target (i.e. second bias voltage) with either an AC or DC power source of less than 1 kHz (col. 6, lines 58-64; col. 7, lines 31-36), thus different power sources and different voltages are used. It is also well known that AC and RF power supplies are pulsating and that magnitude of the pulse is known to directly affect the cycle of the pulse as evidenced by www.wikipedia.com (Document U of PTO-892, p. 1, filed 8/2/2007), thus the duty cycles

of the power supplies also differ. Wang '629 further discusses that the target is not only biased with a voltage, but that the target is biased with different voltages (i.e. AC and DC) (col. 7, lines 31-36). Wang '629 cites the advantages of using a target bias of AC or DC as providing a deeper penetration the high density plasma, generating a high ionization fraction of sputtered metal atoms for deep hole (i.e. substrate hole) filling (col. 7, lines 45-54).

It would have been obvious to one of ordinary skill to bias a target or targets using AC and DC power sources as taught in Wang '629 for the apparatus of Wortman '163 in order to gain the advantage of deeper plasma density penetration leading to a high ionization of sputtered metal atoms.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent No. 4,842,653; US Patent No. 5,145,739; US Patent No. 5,783,318; US Patent No. 6,153,313; US Patent No. 6,620,518; US Patent No. 6,770,353 as being related to the state of the art.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 8am-4pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

19. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MAB

MB

Alexa Neckel

ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER